AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.(Currently Amended) A method for operating a synchronous space division multiple access, code division multiple access communications system, comprising:

within a coverage area of a base station (BS), assigning the same spreading code to a plurality of subscriber stations (SSs); and

beamforming using an antenna array at the BS so as to maximize ~~the~~ a signal to interference plus noise ratio for a signal ~~transmitted~~ received from a desired SS by steering a null towards another same-code SS to minimize interference from the same-code SS,

wherein beamforming comprises using channel feedback from at least one SS.

2.(Currently Amended) A method as in claim ~~1~~ 4, wherein the antenna array has M-elements (M>1), wherein individual ones of P orthogonal spreading codes are reused αM times within the coverage area, where $1/M<\alpha< 1$.

3.(Currently Amended) A method as in claim ~~1~~ 4, wherein the step of beamforming comprises a step of despreading the signal received from the desired SS, followed by a step of spatial filtering.

4.(Currently Amended) A method ~~as in claim 1,~~ for operating a synchronous space division multiple access, code division multiple access communications system, comprising:

within a coverage area of a base station (BS), assigning the same spreading code to a plurality of subscriber stations (SSs); and

beamforming using an antenna array at the BS so as to maximize a signal to interference plus noise ratio for a signal received from a desired SS by steering a null towards another same-code SS to minimize interference from the same-code SS,

wherein the step of beamforming comprises ~~steps of operating~~ receiving from the subscriber stations ~~to obtain channel estimates~~ a spatial signature vector that is comprised of ~~the~~ path amplitude and phase from each of *m* BS antenna elements ~~and to send the *m* channel estimates back to the BS as a spatial signature vector~~, and where the BS, from the spatial signature vectors received from a plurality of same-code subscriber stations, computes antenna element weight vectors.

5.(Currently Amended) A synchronous space division multiple access, code division multiple access communications system, comprising a base station having a coverage area ~~and~~ for a set of subscriber stations disposed within said coverage area, said base station comprising an adaptive antenna array for receiving transmissions from said set of subscriber stations and for transmitting signals to said set of subscriber stations, wherein a subset of subscriber stations ~~comprises a plurality of same-code subscriber stations that~~ are assigned an identical spreading code, said base station comprising beamforming circuitry coupled to said adaptive antenna array for maximizing ~~the~~ a signal to interference plus noise ratio for a signal ~~transmitted~~ received from one of said subset of same-code subscriber stations by steering a null towards others of said ~~same-code samecode~~ subset of subscriber stations to minimize interference from the said others of said ~~same-code subscriber stations~~ subset, said beamforming comprising using channel feedback from at least one SS..

6.(Currently Amended) A system as in claim 5, wherein said antenna array comprises M-elements (M>1), wherein individual ones of P orthogonal spreading codes are reused αM times within the coverage area, where $1/M<\alpha< 1$.

7.(Currently Amended) A system as in claim 5, wherein said beamforming circuitry comprises a despreader for despreading a signal received from said one of said subset ~~same-code subscriber station~~ and a spatial filter having an input coupled to an output of said despreader.

8.(Currently Amended) ~~A system as in claim 6,~~ A synchronous space division multiple access, code division multiple access communications system, comprising a base

station having a coverage area for a set of subscriber stations disposed within said coverage area, said base station comprising an adaptive antenna array for receiving transmissions from said set of subscriber stations and for transmitting signals to said set of subscriber stations, wherein a subset of subscriber stations comprises a plurality of subscriber stations that are assigned an identical spreading code, said base station comprising beamforming circuitry coupled to said adaptive antenna array for maximizing a signal to interference plus noise ratio for a signal transmitted from one of said subset subscriber stations by steering a null towards others of said subset of same code samecode subscriber stations to minimize interference from the said others of said subset,

wherein said beamforming circuitry comprises a despreader for despreading a signal received from said one of said subset and a spatial filter having an input coupled to an output of said despreader, and

wherein said system has a maximum system capacity of αMP channels.

9.(Currently Amended) ~~A system as in claim 5,~~ A synchronous space division multiple access, code division multiple access communications system, comprising a base station having a coverage area for a set of subscriber stations disposed within said coverage area, said base station comprising an adaptive antenna array for receiving transmissions from said set of subscriber stations and for transmitting signals to said set of subscriber stations, wherein a subset of subscriber stations comprises a plurality of subscriber stations that are assigned an identical spreading code, said base station comprising beamforming circuitry coupled to said adaptive antenna array for maximizing a signal to interference plus noise ratio for a signal received from one of said subset of subscriber stations by steering a null towards others of said subset of subscriber stations to minimize interference from the said others of said subset,

wherein for a case of independent fading on each antenna element of said antenna array, said system achieves a diversity gain of M, where M is equal to the number of antenna elements of said antenna array.

10.(Currently Amended) ~~A system as in claim 5,~~ A synchronous space division multiple access, code division multiple access communications system, comprising a base station having a coverage area for a set of subscriber stations disposed within said

coverage area, said base station comprising an adaptive antenna array for receiving transmissions from a set of subscriber stations and for transmitting signals to said set of subscriber stations, wherein a subset of subscriber stations comprises a plurality of subscriber stations that are assigned an identical spreading code, said base station comprising beamforming circuitry coupled to said adaptive antenna array for maximizing a signal to interference plus noise ratio for a signal received from one of said subset of subscriber stations by steering a null towards others of said subset of subscriber stations to minimize interference from the said others of said subset,

wherein the BS receives from a plurality of the subset of subscriber stations ~~obtain channel estimates~~ a spatial signature vector that is comprised of ~~the~~ path amplitude and phase from each of *m* BS antenna elements ~~and transmit the *m* channel estimates back to the BS as a spatial signature vector~~, and where said BS, from the spatial signature vectors received from a plurality of ~~samecode~~ the subset of subscriber stations, computes antenna element weight vectors.

11.(New) A method as in claim 1, wherein the antenna array has M-elements (M>1), wherein individual ones of P orthogonal spreading codes are reused αM times within the coverage area, where $1/M<\alpha<1$.

12.(New) A method as in claim 1, wherein the step of beamforming comprises a step of despreading the signal received from the desired SS, followed by a step of spatial filtering.

13.(New) A method as in claim 12, further comprising transmitting a message from the BS to a same-code SS by combining results of the spatial filtering for at least two same-code SSs followed by spreading the message and transmitting.

14. (New) A method as in claim 1, wherein said channel feedback comprises an estimate of path amplitude for at least two of the antennas of the array.

15. (New) A method as in claim 1, wherein the channel feedback comprises an estimate of phase for at least two of the antennas of the array.

16. (New) A method as in claim 1, wherein the channel feedback is from at least the desired SS and another same-code SSs.

17.(New) A method as in claim 5, wherein said channel feedback comprises an estimate of path amplitude for at least two of the antennas of the array.

18. (New) A method as in claim 5, wherein the channel feedback comprises an estimate of phase for at least two of the antennas of the array.

19. (New) A method as in claim 5, wherein the channel feedback is from the one and at least another of said subset of subscriber stations.